REMARKS

The Amendments

With this amendment, claims 1 and 19-37 are pending herein.

Claims 2-18 have been cancelled without prejudice.

Claim 19 has been amended to specify that the beads comprise a dispersing agent. Support is found, e.g., in the paragraph bridging pages 7 and 8.

Claim 20 has been amended to clarify that the dispersing agent is covalently bound within the polymeric matrix. Support is found, e.g., at page 7, lines 27-28.

Claim 21 has been amended to incorporate the limitations of as-filed claim 1 and additionally to specify that the amine groups are provided by polymerized residues of said one or more polymerizable monomers. Support is found, e.g., in the last paragraph of page 9.

New dependent claims 22-37 have been added to present limitations of as-filed claims 2-17.

The Restriction Requirement

Restriction has been required between the following groups:

Group I, claims 1-18, drawn to a process for preparing polymeric beads; and

Group II, claims 19-21, drawn to polymeric beads.

Applicants elect Group II, claims 19-21, with traverse (see below).

The Requirement for Election of Species

The Restriction Requirement also includes a requirement for election of species. The Office Action states:

> This application contains claims directed to the following patentably distinct species: (1) the two or more polymerizable monomer, inclusive of the various crosslinking and functional monomers species claimed and disclosed. (2) the one or more polymerizable backbone monomer inclusive of the various species disclosed. (3) the magnetic particles inclusive of the various species expressed in claim 16. (4) the stabilizing agent inclusive of the various disclosed species. (5) the dispersing agent which reacts with at least one monomer, inclusive of the various disclosed species.
>
> Applicant is required under 35 U.S.C. 121 to elect a single ultimate disclosed species for each of the above genera (1)-(5) for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Where specific species are not identified in the claims, applicant is requested to elect a specific ultimate species from the specification. An alternative method of election is to identify an Example, which collectively exemplifies all the elected species. Currently, claims 1 and 19 are generic.
>
> Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.
>
> Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).
>
> Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

Since the Office Action requires that a single ultimate disclosed species for each of the above genera (1)-(5) for prosecution on the merits be elected, Applicants elect the species of Example 1. Components 8 (divinyl benzene) and 9 (glycidyl methacrylate) are specific examples of the monomers outlined in genus 1. Component 7 (γ-Fe_2O_3) is a specific example of the magnetic particles referred to in genus 3. Component 2 (Gobsenol GH20®, a high molecular weight polymeric surfactant, a polyvinyl alcohol) is a specific example of the stabilizing agent mentioned in genus 4. Component 6 (Solsperse 24000®, a solid-phase dispersing agent that is a block copolymer of poly(hydroxystearic acid) and

poly(ethyleneimine)) is a specific example of the dispersing agent mentioned in genus 5. Further, Applicants nominate styrene as a specific example of the backbone monomer mentioned in genus 2 (see page 6, line 5 of the specification).

However, if the Office Action intended only that one of the five genera identified be elected, Applicants elect genus 1, and as the species thereof, elect components 8 and 9 (divinyl benzene and glycidyl methacrylate) of Example 1 as the two or more polymerizable monomers.

Claims readable on the elected species of genus 1 having components 8 and 9 of Example 1 (divinyl benzene and glycidyl methacrylate) as the two or more polymerizable monomers, are 1, 19-24, 26, 32, and 34-37.

Claims readable on the elected species of genus 2 having styrene as the backbone monomer are claims 1 and 19-37.

Claims readable on the elected species of genus 3 having component 7 of Example 1 (γ-Fe_2O_3) as the magnetic particles are claims 1 and 19-37

Claims readable on the elected species of genus 4 having component 2 of Example 1 (the high molecular weight polyvinyl alcohol surfactant, Gobsenol GH20®) as the stabilizing agent, are claims 1 and 19-37.

Claims readable on the elected species of genus 5 having component 6 of Example 1 (Solsperse 24000®, a solid-phase dispersing agent that is a block copolymer of poly(hydroxystearic acid) and poly(ethyleneimine)) as the dispersing agent that reacts with at least one monomer are claims 1 and 19-37.

Traversal of Restriction Requirement

This Restriction Requirement is respectfully traversed. The Office Action asserts:

> The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Claims 19-20 lacks novelty and inventive step over the prior art references set forth in the Internal Search Report (i.e. US 4,269,760, US 4,123,396 and US 6,590,094).

However, the claims of Group II as amended **do** recite the same special technical feature as the claims of Group I, namely the dispersing agent. Further, the cited patents **do not** anticipate this technical feature, which therefore renders all the claims novel over the cited references. In addition, claim 21 of Group II recites all the technical features of Group I. Restriction is therefore no longer proper, and withdrawal of the restriction requirement is respectfully requested.

The cited references do not anticipate the claims of Group II.

The present invention relates to complexing resins that are particularly effective at selectively removing transition metals from continuous high flows, particularly from aqueous systems. As indicated in the last paragraph on page 1 of the specification, there are considerable problems associated with effective removal of transition metals from substantial flows such as industrial waste waters and mine drainage.

The polymeric beads of complexing resin in accordance with the invention are prepared by a process comprising producing a dispersion having a continuous aqueous phase and a dispersed organic phase, the organic phase comprising one or more polymerizable monomers, magnetic particles and a dispersing agent for dispersing the magnetic particles in the organic phase. The polymerizable monomers are polymerized to form the polymeric beads that incorporate the magnetic particles and include amine groups capable of complexing a transition metal cation. The amine groups are provided by polymerized residues of the polymerizable monomers or by reaction of the polymeric beads with one or more compounds. By virtue of this process, the polymeric beads of complexing resin are advantageously provided with a polymer matrix having magnetic particles and a dispersing agent dispersed substantially uniformly therein.

US 4,269,760 discloses methodology for preparing a range of fine spherical polymeric particles by suspension polymerization. The ability to form such fine spherical particles is said to result from the use of an inorganic dispersion stabilizer that can ionically bond with oppositely charged ionizable monomers during polymerization. By this process, a layer of the inorganic dispersion stabilizer is believed to form around the growing polymeric particles, which in turn prevents cohesion of the particles during polymerization (see for example the paragraph bridging columns 5 and 6).

Although the spherical polymeric particles disclosed in this US reference can incorporate a variety of magnetic particles, the method used to prepare the polymeric particles does not utilize a dispersing agent for dispersing the magnetic particles in the organic phase. In particular, the inorganic dispersion stabilizer referred to in the US reference is used to stabilize the polymeric particles during polymerization and not as a dispersing agent for magnetic particles.

In the absence of a dispersing agent, it is submitted that the polymeric beads disclosed in this US reference would not have magnetic particles distributed in a substantially uniform fashion throughout the polymer matrix.

In contrast, the polymeric beads in accordance with the present invention are prepared with and incorporate a dispersing agent for dispersing the magnetic particles within the organic phase. Use of the dispersing agent in this way is believed to promote the uniform distribution of the magnetic particles throughout the resulting polymer matrix of the polymer beads upon polymerization of the monomers. This in turn is believed to improve the mechanical strength of the polymeric beads and minimize the loss of magnetic material by erosion compared with the situation where the magnetic particles were located primarily around the outer perimeter of the beads (i.e. as is believed to be case in the fine spherical polymeric particles disclosed in this US reference).

It is also noted that the amine functionalized monomers used in the preparation of the polymeric beads disclosed in the US reference are preferably used in an amount of

only about 0.5 wt.%. Although the claims of the application do not define a particular amount of amine groups that need to be present, the polymeric beads defined by these claims must necessarily be capable of functioning as a complexing resin. It is submitted that the low levels of amine functionalized monomers used in preparing the polymeric beads disclosed in the US reference will not confer any significant complexing capacity and therefore the resulting polymeric beads will not be capable of functioning as a complexing resin.

Accordingly, the claims of the application are believed to be both novel and inventive in the light of this document.

US 6,590,094 discloses a method for producing cross-linked polymeric beads doped with superparamagnetic iron oxide and containing basic amino groups. The polymeric beads are described as being suitable for use in nucleic acid diagnostics. The method disclosed for producing the polymeric beads involves first preparing the polymeric beads and then doping the polymeric beads with a metal salt that is subsequently reduced *in situ* to form the superparamagnetic particles (see for example Examples 1 and 2). By this method, it will be appreciated that magnetic particles and a dispersing agent are not used during preparation of the polymeric beads *per se*. Thus, the applicant has some doubt as to whether the resulting polymeric beads would in fact have magnetic material dispersed substantially uniformly throughout the polymeric matrix of the beads. In any event, as the method disclosed in this US reference does not use a dispersing agent in the preparation of the polymeric beads, it will be appreciated that the beads will not have a dispersing agent substantially uniformly dispersed throughout the polymeric matrix.

Furthermore, the polymeric beads disclosed in this US reference are said to comprise "superparamagnetic" iron oxide. Those skilled in the art will appreciate that "superparamagnetic" iron oxide is not "magnetic" in the context required of the "magnetic particles" that are dispersed throughout the polymeric beads of the present invention. In particular, as will be appreciated from at least page 7, lines 8 and 9 and page 13, lines 4 and 9 of the present application, the "magnetic particles" must be capable of being

magnetized so as to retain magnetic remanence (i.e. the beads will be capable of being magnetically attracted to each other in the absence of a magnetic field). In contrast, the polymeric beads disclosed in this US reference are said to have a low magnetic remanence and will therefore not be attracted to each other in the absence of a magnetic field (see the first paragraph of column 3 in the US reference).

Accordingly, the claims of the present application are believed to be both novel and inventive in the light of this document.

US 4,123,396 discloses metal/metal oxide-containing micro spheres used in catalysis reactions, labeling applications and separation/analysis of protein materials. The metal/metal oxide containing micro spheres are formed by first preparing a micro sphere comprising amine functionality. The amine functionalized micro sphere is then complexed with metal salts which are in turn reduced to form finely divided free metal or metal oxide particles (which may or may not be magnetic). As with our comments above in respect of US 6,590,094, the applicant believes that the metal or metal oxide particles associated with the micro spheres disclosed in this reference are more likely to be located on or near the surface of the polymeric matrix that makes up the micro spheres. In any event, it is submitted that this US reference fails to disclose or suggest the use of a dispersing agent for dispersing magnetic particles in the organic phase during polymerization. Thus, the micro spheres are at the very least believed not to have a dispersing agent substantially uniformly dispersed throughout the polymeric matrix.

Accordingly, the claims of the present application are believed to be both novel and inventive in the light of this document.

It has been shown that the recitation in the claims of both Groups I and II of a dispersing agent that disperses magnetic particles makes these claims novel and nonobvious. Thus, it is not the case that both groups of claims lack the same or corresponding special technical features. This technical feature is the dispersing agent. Nor is it the case that the claims of Group II are anticipated by the cited references. Since

these are the reasons provided in the Office Action for requiring restriction, and they do not apply to the claims as amended herein, withdrawal of the Restriction Requirement is respectfully requested.

Request for Rejoinder

In the event the Restriction Requirement is not withdrawn, it is respectfully requested that claim 1 be rejoined with the elected claims upon allowance of the elected claims. This is proper because claim 1 contains the novel technical feature recited in the elected claims.

Conclusion

In view of the foregoing arguments and amendments, withdrawal of the Restriction Requirement is respectfully requested. This application appearing to be in condition for allowance, passage to issuance is also respectfully requested. A Request for Extension of Time (two months) together with the requisite large-entity fee in the amount of $450 is submitted herewith. If this is incorrect, however, please deduct the amount needed from deposit account 07-1969.

Respectfully submitted,

/ellenwinner/

Ellen P. Winner
Reg. No. 28547

GREENLEE, WINNER AND SULLIVAN, P.C.
4875 Pearl East Circle, Suite 200
Boulder, CO 80301
Telephone (303) 499-8080
Facsimile: (303) 499-8089
Email: winner@greenwin.com

Attorney Docket No.: 56-04
bmk: June 4, 2007